National Institute of Environmental Health Sciences

Food and water security in a changing arctic climate

Author(s): White DM, Craig Gerlach S, Loring P, Tidwell AC, Chambers MC
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Abstract:

In the Arctic, permafrost extends up to 500 m below the ground surface, and it is generally just the top metre that thaws in summer. Lakes, rivers, and wetlands on the arctic landscape are normally not connected with groundwater in the same way that they are in temperate regions. When the surface is frozen in winter, only lakes deeper than 2 m and rivers with significant flow retain liquid water. Surface water is largely abundant in summer, when it serves as a breeding ground for fish, birds, and mammals. In winter, many mammals and birds are forced to migrate out of the Arctic. Fish must seek out lakes or rivers deep enough to provide good overwintering habitat. Humans in the Arctic rely on surface water in many ways. Surface water meets domestic needs such as drinking, cooking, and cleaning as well as subsistence and industrial demands. Indigenous communities depend on sea ice and waterways for transportation across the landscape and access to traditional country foods. The minerals, mining, and oil and gas industries also use large quantities of surface water during winter to build ice roads and maintain infrastructure. As demand for this limited, but heavily-relied-upon resource continues to increase, it is now more critical than ever to understand the impacts of climate change on food and water security in the Arctic.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Security, Food/Water Security

Food/Water Security: Livestock Productivity

Geographic Feature:

resource focuses on specific type of geography

Arctic, Freshwater

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Malnutrition/Undernutrition

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: Indigenous communities

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content